

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

CONDITIONAL MAJOR (DRAFT PERMIT) No. F-05-043

PITTSBURG TANK & TOWER CO., INC.

HENDERSON, KY.

OCTOBER 24, 2005

D. BRIAN BALLARD, REVIEWER

SOURCE I.D. #: 021-101-00132

SOURCE A.I. #: 1829

ACTIVITY #: APE20050002

SOURCE DESCRIPTION:

Permit F-05-043 is a renewal permit. Pittsburg Tank & Tower Inc., was issued permit F-00-019 on January 5, 2001. This permit authorized the construction of facilities for the fabrication of steel water storage tanks, including a steel shot abrasive blasting system and primer/paint application. A revised permit was issued on July 17, 2001 for the addition of a steel shot blast system for small parts. The facility is located at 1 Water Tank Place in Henderson.

COMMENTS:

EP01 is an abrasive blasting area for the removal of welding slag and surface rust from tank sections.

A large enclosed building, a floor reclaim system, and a 8,900 cfm dust collector are used to control particulate matter emissions.

The building has been assumed to capture 100% of the particulate matter from the process.

Based on information provided in the source's application, 0.5% of the shot material used does not get reclaimed and therefore has been assumed to be the uncontrolled emission.

All of the uncontrolled emission has been assumed to be captured by the dust collection system.

Based on the source's application, 99.99% control efficiency has been assumed for the dust collection system (Devices of this kind commonly achieve 99+%. Since there is no significant difference in emission fees or compliance demonstration, the Division has not pursued verification of the control efficiency).

EP02 is a building with an airless spray gun used for painting and priming tank sections.

The building has been assumed to capture 100% of the particulate emissions.

Four 3' wide x 80' long exhaust pits using a polyester diffusion media or equivalent is used to control particulate emissions.

The source has provided manufacturer data that estimates the control efficiency of the diffusion media at 99.99%. Therefore, the particulate matter control efficiency has been assumed to be 99.99%.

Transfer efficiency has been assumed to be 75% because of the type of gun used and the size of the items painted. The large transfer efficiency has the effect of reducing PM emissions.

No VOC controls are present.

There is a bottleneck. The source can only paint what is first prepared. Painting is limited to 40 minutes every hour because it takes longer to abrasive blast the tanks than to paint them. Potential to Emit (PTE) is calculated using 5,840 hrs/yr.

EP03 is cutting and welding activities. No controls are present.

COMMENTS(CONTINUED):

Toxic emissions from the source are modeled using SCREEN3. The source of potentially toxic emissions is the paint booth. The paint booth is modeled as a single point source. Emissions from the paint booth are vented through the Aerovent Sloped Exhaust System. There are two Aerovent systems, each equipped with two fans. The flow rate produced by each fan is 37,500 actual cubic feet per minute (ACFM). The diameter of each fan is 42 inches. The stack parameters used for modeling purposes are a height of 34 feet (10.36 meters), a diameter of 14 feet (4.27 meters), a flow rate of 150,000 ACFM and a temperature of 293 degrees Kelvin (68°F). The diameter and flow rate used in the model are determined by summing the individual diameters and flow rates of each fan. The emissions are modeled starting at a distance of 100 yards (91.44 meters) away from the theoretical stack and out to a final distance of 50,000 meters. The maximum concentration determined by the model occurs at 91 meters. The toxics evaluated are ethylbenzene (CAS No. 100-41-4), methyl ethyl ketone (CAS No. 78-93-3), methylene diphenyl diisocyanate (CAS No. 101-68-8), toluene (108-88-3) and xylene (CAS No. 1330-20-7).

The table presents the maximum potential emission rate of each toxic along with the prioritized chronic dose response value (PRDV) for that particulate toxic. The PRDV's can be found at <http://www.epa.gov/ttn/atw/toxsource/table1.pdf>. These are the health-based standards recommended by the EPA, Office of Air Quality Planning and Standards (OAQPS). The source of the health based standard for each of these toxics is the EPA Integrated Risk Information System (IRIS).

Pollutants	CAS No.	Emissions (lb/hr)	Emissions (g/s)	Health based Standard (ug/m ³)	Source	Modeled Concentration (ug/m ³)
Ethylbenzene	100-41-4	7.63	0.961	1000	IRIS	28.55
Xylene	1330-20-7	30.75	3.874	100	IRIS	115.07
Methyl Ethyl Ketone	78-93-3	9.38	1.182	5000	IRIS	35.10
Toluene	108-88-3	4.63	0.583	400	IRIS	17.33
Methylene diphenyl diisocyanate	101-68-8	8.13	1.024	0.6	IRIS	30.42

Table 1 – Comparison of SCREEN3 Model Results and Health Based Standards

The results of the modeling show that maximum potential emission rate of methylene diphenyl diisocyanate (MDI) results in an exceedance of the recommended health based standard. MDI is present in the coating Tneme-Zinc, Series: F090-0097A, Product Class: polymeric diisocyanate, zinc reddish gray. The recommended PRDV for MDI is 0.6 µg/m³. The acceptable “target risk” for noncancer endpoints is a hazard index of 1 or less, where hazard index is defined as:

$$\text{Hazard Index} = \frac{\text{Modeled Concentration of } X}{\text{Concentration of } X \text{ in Table}}$$

The hazard index based on potential to emit for MDI is calculated to be 50.7. The allowable emission rate of MDI that results in a Hazard Index of 1 is 0.70 tons (1,402 lb) per year.

COMMENTS(CONTINUED):

The concentration of Xylene predicted by the model is higher than the health based standard concentration. The predicted concentration assumes that Xylene is emitted at a rate of 30.75 lb/hour, 8,760 hours per year. This is the equivalent of 134.7 tons/year of Xylene emissions. This facility has taken limits of 9.0 tons/year for single HAPs. Given this annual emission limit, the predicted concentration for Xylene emissions is $[(115.1)(9.0)]/(134.7)$ or $7.7 \mu\text{g}/\text{m}^3$. This gives a hazard index of $(7.7/100)$ or 0.077, which is less than 1.0. Therefore the monitoring and record keeping of xylene emissions for the purpose of demonstrating compliance with the 9.0 tons/year limit will also serve to demonstrate compliance with 401 KAR 63:020.

At EP01, 0.5% of the blasting material used has been assumed to be the uncontrolled emission factor because the source has asserted that 0.5% is all the blasting material that will be lost after 200 cycles. This assumption has been compared to data from AP-42 Chapter 13.2.6. The direct comparison between AP-42 and the source's estimate is not obvious but the controlled AP-42 emission factor still demonstrates compliance with the particulate matter emission limitations in 401 KAR 59:010. Because compliance is demonstrated using either estimate and the AP-42 emission factor is so uncertain, the Division will accept the source's estimate for particulate matter emissions from EP01 but the Division may require further verification of the particulate matter emission rate at a latter date if inspections or other relevant information warrant.

At EP02, if a pollutant is used, it has been assumed to be emitted unless recovered. Transfer efficiency and add on controls are the only other reductions to spraying emissions. A transfer efficiency of 75% was assumed based on the source's application despite similar reviews by the Division estimating 65% transfer efficiency since there is no significant difference for compliance with limits in 401 KAR 59:010. If inspections or other relevant information warrant, the transfer efficiency should be reevaluated.

At EP03, the source has not provided any details. Therefore, the Division has assumed that electrode type E11018 is being used and that the AP-42 emission factor of 16.4 lbs of PM/1000 lbs of electrode consumed applies.

EMISSION AND OPERATING CAPS DESCRIPTION:

The facility will be subject to emission caps of ninety (90.0) tons per year for VOC, nine (9) tons per year for single HAP and twenty-two and a half (22.5) tons per year for combined HAPS. These emission caps will preclude the applicability of the following regulations: 401 KAR 59:225, New miscellaneous metal parts and product surface coating operations and 40 CFR 63, Subpart Mmmm, National Emission Standards for Miscellaneous Metal Parts and Products Surface Coating Operations. The source will be subject to an emission cap of 0.70 tons (1,402 lb) per year for methylene diphenyl diisocyanate (CAS No. 101-68-8) in order to demonstrate compliance with 401 KAR 63:020, potentially hazardous matter and toxic substances.

PERIODIC MONITORING:

EP01 is controlled by a dust collection system and when operated as designed there is little chance of violating mass or opacity standards. Since the dust collection system is so effective, direct measurements of mass emissions have not been required but some assurance that the collection system is working properly has been required. Monitoring of a magnehelic gage will be used to help assure proper operation of the dust collection system. By monitoring pressure drop once per shift (little change is expected over a shift), clogging and holes can be detected and proper operation is a reasonable assumption. Additionally, the doors must be shut during blasting so that the emissions will go to the collection system. However, closing the building doors is a logical step in the process and no monitoring will therefore be required on the doors (the doors will be assumed to be closed unless the source reports the doors open, an inspection notes the doors open, or other credible evidence so indicates). A qualitative visual observation of the opacity of emissions from the dust collection system stack (clean exhaust side) shall be required and a log of the observations shall be maintained. If visible emissions from the stack are seen (not including condensed water vapor within the plume), then the opacity shall be determined by Reference Method 9. If emissions are in excess of the applicable opacity limit, then an inspection shall be initiated of control equipment for all necessary repairs.

Given the control device used (filters) at EP02, there is little chance of violating a mass or opacity standard. For this reason, direct measurements of mass emissions will not be required but some assurance that the filters are working properly will be needed. First, the emissions must be captured.

If the doors are closed all the emissions have been assumed to be captured. Again, this is a logical step and will therefore require no monitoring. Once the emissions have been captured, the filters will assure compliance with mass and opacity standards at EP02. If the filters are inspected to determine if replacement is needed each day when painting is done, there is little chance that the filters won't work. A qualitative visual observation of the opacity of emissions from the over spray collection system stacks shall be required and a log of the observations shall be maintained. If visible emissions from the stack are seen (not including condensed water vapor within the plume), then the opacity shall be determined by Reference Method 9. If emissions are in excess of the applicable opacity limit, then an inspection shall be initiated of control equipment for all necessary repairs. The source will be required to monitor the twelve-month rolling average emissions of VOC, combined HAP, single HAP and specifically methylene diphenyl diisocyanate (CAS No. 101-68-8).

Due to the nature of the activities at EP03 no monitoring will be required except for raw material usage. Cutting and welding emissions should cause little opacity and PM emissions should be below allowable levels.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.